PCT/8

FORM PTO-1390 (REV 11-98) U.S. DEPARTMENT OF COMMERCE PATENT AND TRADEMARK OFFICE	ATTORNEY'S DOCKET NUMBER
TRANSMITTAL LETTER TO THE UNITED STATES DESIGNATED/ELECTED OFFICE (DO/EO/US) CONCERNING A FILING UNDER 35 U.S.C. 371	22599 N1PCT/US
	U.S. APPLICATION NO. (If known, see 37 CFR 1.5) 09/601846

INTERNATIONAL APPLICATION NO.	INTERNATIONAL FILING DATE	PRIORITY DATE CLAIMED
PCT/EP99/00750	February 5, 1999	February 6, 1998

TITLE OF INVENTION: INTERNAL ELEMENT FOR A DOOR

APPLICANT(S) FOR DO/EO/US: Eduard Brück

Applicant herewith submits to the United States Designated/Elected Office (DO/EO/US) the following items and other information:

1. [X] This is a **FIRST** submission of items concerning a filing under 35 U.S.C. 371.
2. [ ] This is a **SECOND** or **SUBSEQUENT** submission of items concerning a filing under 35 U.S.C. 371.
3. [X] This express request to begin national examination procedures (35 U.S.C. 371(f)) at any time rather than delay examination until the expiration of the applicable time limit set in 35 U.S.C. 371(b) and PCT Articles 22 and 39(1)(PCT/IPEA/401)
4. [X] A proper Demand for International Preliminary Examination was made by the 19th month from the earliest claimed priority date. /
5. [X] A copy of the International Application as filed (35 U.S.C. 371(c)(2))
   a. [ ] is transmitted herewith (required only if not transmitted by the International Bureau).
   b. [X] has been transmitted by the International Bureau. (PCT/IB/308)
   c. [ ] is not required, as the application was filed in the United States Receiving Office (RO/US).
6. [X] A translation of the International Application into English (35 U.S.C. 371(c)(2)). (26 pages)
7. [ ] Amendments to the claims of the International Application under PCT Article 19 (35 U.S.C. 371(c)(3))
   a. [ ] are transmitted herewith (required only if not transmitted by the International Bureau).
   b. [ ] have been transmitted by the International Bureau.
   c. [ ] have not been made; however, the time limit for making such amendments has NOT expired.
   d. [ ] have not been made and will not be made.
8. [ ] A translation of the amendments to the claims under PCT Article 19 (35 U.S.C. 371(c)(3)).
9. [X] An unsigned oath or declaration of the inventor(s) (35 U.S.C. 371(c)(4)). (2 pages)
10. [ ] A translation of the annexes to the International Preliminary Examination Report under PCT Article 36 (35 U.S.C. 371(c)(5)).

Items 11. to 16. below concern document(s) or information included:

11. [X] An Information Disclosure Statement under 37 CFR 1.97 and 1.98, 2 PTO-1449 forms, and copy of (EPO) International Search Report (European Search authority) 3 pages in English, and 2 references
12. [ ] An assignment document for recording. A separate cover sheet in compliance with 37 CFR 3.28 and 3.31 is included.
13. [X] A FIRST preliminary amendment.*Enter Preliminary Amendment before calculating claim fees
    [ ] A SECOND or SUBSEQUENT preliminary amendment.
14. [ ] A substitute specification.
15. [ ] A change of power of attorney and/or address letter.
16. [X] Other items or information: WO 99/39931 (cover page)
17. [X] PCT/IPEA/401
18. [X] PCT/IB/308
19. [X] CLAIM IS HEREBY MADE OF THE BENEFIT OF THE FILING DATE OF German Patent Application 198 04 781.9 filed February 6, 1998 UNDER 35 USC 119
20. [X] Express Mail mailing label No. EJ450234300US deposited August 4, 2000

U.S. APPLICATION NO. (if known, see 37 CFR 1.5)	INTERNATIONAL APPLICATION NO.	ATTORNEY'S DOCKET NUMBER
09/601846	PCT/EP99/00750	22599N1 PCT/US

	CALCULATIONS PTO USE ONLY	
17. [X] The following fees are submitted:		
BASIC NATIONAL FEE (37 CFR 1.492 (a) (1) - (5)) :		
Neither international preliminary examination fee (37 CFR 1.482) nor international search fee (37 CFR 1.445(a)(2)) paid to USPTO and International Search Report not prepared by the EPO or JPO **$970.00**		
International preliminary examination fee (37 CFR 1.482) not paid to USPTO but International Search Report prepared by the EPO or JPO **$840.00**		
International preliminary examination fee (37 CFR 1.482) not paid to USPTO but international search fee (37 CFR 1.445(a)(2)) paid to USPTO **$760.00**		
International preliminary examination fee paid to USPTO (37 CFR 1.482) but all claims did not satisfy provisions of PCT Article 33(1)-(4) **$670.00**		
International preliminary examination fee paid to USPTO (37 CFR 1.482) and all claims satisfied provisions of PCT Article 33(1)-(4) **$96.00**		
ENTER APPROPRIATE BASIC FEE AMOUNT =	$ 840.00	
Surcharge of **$130.00** for furnishing the oath or declaration later than [ ] 20 [ ] 30 months from the earliest claimed priority date (37 CFR 1.492(e)).	$	

CLAIMS	NUMBER FILED	NUMBER EXTRA	RATE		
Total claims	22 - 20 =	2	X **$18.00**	$ 36	
Independent claims	1 - 3 =	0	X **$78.00**	$ 0	
MULTIPLE DEPENDENT CLAIM(S) (if applicable)	*		+ **$260.00**	$ 0	
TOTAL OF ABOVE CALCULATIONS =				$ 876.00	
Reduction of 1/2 for filing by small entity, if applicable. A Small Entity Statement must also by filed (Note 37 CFR 1.9, 1.27, 1.28).				$	
SUBTOTAL =				$ 876.00	
Processing fee of **$130.00** for furnishing the English translation later than [ ] 20 [ ] 30 months from the earliest claimed priority date (37 CFR 1.492(f)). +				$	
TOTAL NATIONAL FEE =				$ 876.00	
Fee for recording the enclosed assignment (37 CFR 1.21(h)). The assignment must be accompanied by an appropriate cover sheet (37 CFR 3.28, 3.31). **$40.00** per property +				$	
TOTAL FEES ENCLOSED =				$ 876.00	
				Amount to be: refunded	$
				charged	$

a. [X] A check in the amount of $876.00 to cover the above fees is enclosed. (13246)

b. [ ] Please charge my Deposit Account No. _____ in the amount of $_____ to cover the above fees. A duplicate copy of this sheet is enclosed.

c. [X] The Commissioner is hereby authorized to charge any additional fees which may be required, or credit any overpayment to Deposit Account No. 06-0105. A duplicate copy of this sheet is enclosed.

NOTE: Where an appropriate time limit under 37 CFR 1.494 or 1.495 has not been met, a petition to revive (37 CFR 1.137(a) or (b)) must be filed and granted to restore the application to pending status.

*Enter Preliminary Amendment before calculating claim fees

SEND ALL CORRESPONDENCE TO:
MARTIN A. FARBER
866 United Nations Plaza, Suite 473
New York, NY 10017
Tel (212) 758-2878
Fax (212) 758-2913

SIGNATURE:

Martin A. Farber
NAME

Reg. No. 22,345
REGISTRATION NUMBER

22599N1PCT/US

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

EXPRESS MAIL mailing label No. EJ450234300US
Deposited August 4, 2000

USA PCT National Stage Patent Application
PCT/EP99/00750 filed February 5, 1999

Eduard Brück

INTERNAL ELEMENT FOR A DOOR

Priority: German Patent Application
198 04 781.9 filed February 6, 1998

Hon. Commissioner of Patents and Trademarks
Washington, D.C. 20231

S I R :

PRELIMINARY AMENDMENT

Please amend this application simultaneously with filing this

National Stage application as follows:

IN THE ABSTRACT

Please use the English Abstract on WO 99/39931

IN THE SPECIFICATION

PAGE 1

Line 5, before this line, after the title, insert

--FIELD AND BACKGROUND OF THE INVENTION--

Line 7, before the period "." insert --, and a sealing body being disposed at the edge--

Line 25, after "etc." start a new paragraph with the words

--A door internal element having above-mentioned features is known from German 196 20 148.--

Line 27, before this line insert

--SUMMARY OF THE INVENTION--

Lines 31-35, change "features of ... the edge." to --introductory-mentioned type wherein the door internal element (3) is produced using the foam injection process, and with respect to a cross section has two solid boundary layers (52) and a foamed, porous central layer (54).--

Line 37, change "such a design" to --the invention--

Line 32, delete "U"

Line 33, change "..." to 0 836 924--

Line 34, change "as to" to --in--

Line 35, change "full content" to --entirety--

PAGE 6

Line 6, before this line insert

--BRIEF DESCRIPTION OF THE DRAWINGS--

Line 8, change "drawing" to --drawings--

PAGE 8

Line 14, after the comma "," insert --and-

Line 19, before this line insert

--DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENT--

PAGE 22

Lines 4-10, delete these lines

IN THE CLAIMS

Before claim 1, change "Claims" to --I CLAIM:--

Please cancel claims 1-22 without prejudice or disclaimer of the subject matter therein and substitute the following new claims 23-44 therefor:

--23. Door internal element (3) for motor vehicle doors (1), to be arranged between a door outer side and an inner lining (7), a sealing body (12) being disposed at an edge, wherein the door internal element (3) is produced foam injected, and with respect to a cross section has two solid boundary layers (52) and a foamed, porous central layer (54).

24. Door internal element according to claim 23, further comprising cable holders (17) moulded onto the door internal element (3).

25. Door internal element according to claim 23, further comprising a mounting collar (31) for holding a loudspeaker (32), wherein said mounting collar is moulded on.

26. Door internal element according to claim 23, further comprising a cable bushing (21) which is moulded out.

27. Door internal element according to claim 26, wherein the cable bushing (21) has an edging (24) made of soft plastic.

28. Door internal element according to claim 23, wherein the door internal element (3) has a moulded-in bush (26).

29. Door internal element according to claim 23, wherein the door internal element (3) has an inserted support plate (36) for mounting a motor (37).

30. Door internal element according to claim 29, wherein the support plate (36) is a metal plate.

31. Door internal element according to claim 23, wherein the door internal element (3) has bridges (45) which are moulded out by injection-moulding and an underside (46) of the bridges is exposed.

32. Door internal element according to claim 23, further comprising a partial wall offset (49) in the door internal element (3) as a laying path for a strip-like insert (51).

33. Door internal element according to claim 23, wherein the sealing body (12) is formed as a bead, and said bead is applied to a wide face (55) of the door internal element (3).

34. Door internal element according to claim 23, wherein the sealing body (12) is located in an integrally formed groove (57).

35. Door internal element according to claim 34, wherein the groove (57) is formed by means of a wall offset so as to mould out a foam injection-formed bead (58) on a rear side constituting another wide face (59).

36. Door internal element according to claim 23, wherein density of the door internal element (3) varies over a cross section between 0.7 and 1.4 g/cm^3 in an unfoamed boundary layer (52) and is between 0.1 and 0.6 g/cm^3 in the foamed central layer (54).

37. Door internal element according to claim 23, wherein the foam injection-formed material contains a proportion of an HMS polymer.

38. Door internal element according to claim 23, wherein the foam injection-formed material contains fillers or reinforcing substances.

39. Door internal element according to claim 23, further comprising anchoring apertures (60) provided on an end face, said anchoring apertures have a solid hole lining (61) lying in a direction of the apertures as a result of integral moulding-out.

40. Door internal element according to claim 23, further comprising an anchoring aperture (60) surrounded by an integrally foamed tab section (62) which projects on an end face.

41. Door internal element according to claim 23, further comprising bushes, threaded inserts, and the like incorporated in the door internal element (3) by injection moulding therearound.

42. Door internal element according to claim 23, wherein some material is removed or a cut which does not extend completely through is made in the door internal element (3) on a wide face side, so as to provide access to the central layer (54) of lower-density.

43. Door internal element according to claim 23, wherein exposed regions of the central layer (54) serve as access for anchoring means (64).

44. Door internal element according to claim 23, further comprising clips (71) secured in the door internal element (3), leaving an integral outer skin.--

R E M A R K S

This Amendment accompanying this application is being made to present the amended PCT claims and to amend the claims in order to avoid multiple-dependent claim fees. No multiple-dependent claim fees should apply. The Examiner is respectfully requested to enter this Amendment prior to calculation of the filing fee as of the national stage filing date, and to provide an action on the merits. Therefore no multiple-dependent claim fees should be charged in this application.

The specification and claims also have been amended for formal improvement to comply with USA practice.

Please use the Abstract on the cover sheet of WO 99/39931.

Respectfully submitted
Eduard Brück

by: _____
MARTIN A. FARBER
Attorney for Applicant
Registered Representative
Registration No:. 22,345

866 United Nations Plaza
Suite 473
New York, NY 10017
(212) 758-2878

Internal element for a door

The invention relates to an internal element for a door for motor vehicle doors, to be arranged between a door outer side and an inner lining.

A door internal element of this type which is incorporated in the motor vehicle door is support for numerous functional parts and their securing elements. Generally, the door internal element is made from sheet steel. Depending on the basic design, this makes such supports too heavy. Moreover, there is outlay involved in sealing apertures. Finally, the forming options are limited. Alternatively, door internal elements made from plastics materials have been used as supports for door components. Apart from a reduction in weight, this choice faces problems relating to the acoustic function; there is no significant insulation or damping. This solution is also unsatisfactory in terms of providing a water barrier. To compensate for deficiencies of this nature, it is necessary to rely on additional elements such as film or foil, damping sheets, etc.

It is an object of the invention to provide a door internal element which is advantageous in use and is simple in terms of the production engineering required.

This object is achieved first and foremost by a door internal element in accordance with the features of Claim 1 in which it is provided that, during production using the foam injection process, a sealing body is fitted at the edge.

As a result of such a design, there is achieved a door internal element of the generic type which is easier to

produce and is highly functional in use. Support function and sealing function are combined on a single body of considerably reduced weight. There are improved forming options. The resultant multidirectionality of the substantially sheet-like door internal element makes it stiffer. The vitreous skin formation which is a specific characteristic of the foam injection process constitutes a further stability factor. This is supplemented by good insulation and damping properties. The transition to the door structural part which supports the door internal element, for example a frame-like door interior plate, is very well implemented, specifically also in terms of its sealing function, by the sealing body on the edge. Because of the foam injection formation of the door internal element, there are provided the best possible conditions for the sealing body which can be adhesively bonded in the skin of the foam injection-formed body. This is an elastomer seal which is moulded directly onto the foam injection-formed body and is thus anchored securely in the relatively thin, skin-like layer of the foam injection-formed body. The moulding temperature of the elastomer material is sufficient to cause the skin-like layer of the foam injection-formed body to deflect so that the elastomer material, i.e. the sealing body, can be held therein without any gaps whatsoever. On the other hand, there is also no damage caused to the foam injection-formed body by this. To increase the pliability, the sealing body may have a continuous cavity. This not only reduces the weight, but also saves on material. Further details can be found in DE 295 11 492 U, which is not a prior publication, and EP ... (Application No. 97115150.1). These documents are hereby incorporated as to their full content, also for the purpose of including features of these documents in claims of the present application. Furthermore, it has proven advantageous for cable holders to be moulded onto the door internal

element. Such measures substitute for the corresponding conventional holder means. Furthermore, it is proposed for a mounting collar be moulded on, for holding a loudspeaker. By reinforcing the edge of the corresponding hole, this collar forms a sufficiently secure base for attachment means, such as for example screws, and, at the same time, a sealed transition point. Furthermore, it has proven advantageous for a cable bushing to be moulded out. In order, in this case, to ensure that there is a seal between the cable cord and the cable bushing, the cable bushing has an edging made from soft plastics (TPE). Here too, it is possible, in the same way, to form an elastomer seal with a cavity, so that an extremely elastic annular membrane is provided. Even for the securing elements, such as screws, etc., a corresponding measure is taken into account on the door internal element, in that the door internal element has a moulded-in bush. This is generally a bush which has an internal screw thread. Like the mounting collar explained above, this bush may consist of harder, solid plastics material. Naturally, elements such as the cable bushings and the bush are provided in large numbers taking into account the specific basic design. Furthermore, it is proposed for the door internal element to have an inserted support plate for mounting a motor. Expediently, such a plate is made from metal. It may already be set up for the specific fitting arrangement, i.e. have matching securing holes or clip projections for fixing the baseplate of the motor to a support plate of this type. Finally, it is proposed for the door internal element to have bridges which are moulded on by the foam injection technique and the undersides of which are exposed. It is possible to thread elements behind such loop-like structures, either for the passage of cables or even for the passage of a Bowden cable. Finally, a solution which also offers stability is achieved by means of a partial wall offset in the door internal

element as a laying path for strip-like inserts. This may be used, for example, to hold a steel insert.

Furthermore, the invention proposes that the sealing body be formed as a bead which is applied to a wide face of the door internal element. This can be fitted accurately using a robot. The result is that the materials bond automatically to one another, if appropriate partly by utilizing the heat which is still present in the foam injection-formed body. It is expedient for the sealing body to be located in an integrally formed groove. To ensure that the latter does not form a weak point, the groove is formed by means of a wall offset so as to mould out a foam injection-formed bead on the rear side, that is to say the other wide face. It is thus possible, by way of example, for the object in question to have an overall thickness of only approx. 5 mm. The groove-forming change in direction of the material of the foam injection-formed body even provides increased stability. In this respect, the bead is actually a stabilizing rib. The component is made highly stable if the density of the door internal element varies over a cross section, that is to say is between 0.7 and 1.4 g/cm^3 in an unfoamed boundary zone and is between 0.1 and 0.6 g/cm^3 in the foamed central layer. The density of compact polymer materials is approx. 1 g/cm^3. By means of such a sandwiched structure it is possible to produce components with relatively high stiffness, low weight and great integration potential. Furthermore, it is provided for the foam injection-formed material to contain a proportion of an HMS (High Melt Strength) polymer which is based on PP. This increases the melt stability of the copolymer. The base component itself is approx. 90%. By this structurally isomeric propylene polymer, the processing window is widened and stable cell growth with uniform cell size is produced. There is provided a structure which is as

far as possible homogeneous. Furthermore, it is proposed for the foam injection-formed material to contain fillers or reinforcing substances. Such substances further increase the stiffness of the lightweight components. They may involve adding approx. 20% glass fibres or talc. Furthermore, it is proposed for anchoring apertures to be provided at the end face, which anchoring apertures have a solid hole lining lying in the direction of the aperture as a result of integral moulding-out. At both ends, a sleeve web of this type adjoins the solid boundary layers of the door internal element which lie transversely with respect thereto. The hole lining reinforces the zone, so that securing elements which pass through, such as for example self-tapping screws, etc., clips or the like are subjected to sufficient resistance despite the low density. Furthermore, in this context it is proven advantageous for an anchoring aperture to be surrounded by an integrally foamed tab section which projects from the end face. Such tabs increase the area surrounding the hole and provide more "meat". Furthermore, it is also possible to provide measures which involve incorporating bushes, threaded inserts, etc. in the door internal element by injection moulding around them. They may be metal inserts. One arrangement of even independent importance consists in removing some of the material by milling or cutting, not all the way through, in the door internal element on the wide face, so as to provide access to the lower-density central layer. In so doing, the freedom from apertures of the door internal element is maintained. Only one of the solid boundary layers is provided with a window by which there is provided the desired access for a securing element. This can be embodied in concrete form by the exposed regions of the central layer serving as access for anchoring means. Finally, as an independently significant solution, it is proposed for clips to be secured in the door internal element,

leaving the integral outer skin. These elements may be rotary anchors which can be countersunk in suitable centre-oriented trenches and the star-shaped anchor arms of which cut into the trench flanks.

The subject-matter of the invention is explained in more detail below with reference to an exemplary embodiment which is illustrated in the drawing, in which:

Fig. 1 shows the door internal element in side view,

Fig. 2 shows a section through a vehicle door with incorporated door internal element,

Fig. 3 shows an enlarged excerpt III-III from Fig. 2, showing the edge-side sealing body between door internal element and a door interior plate of the door,

Fig. 4 shows the section on line IV-IV in Figure 1, showing a cable holder,

Fig. 5 shows the section on line V-V in Figure 1, showing a cable bushing with guide collar,

Fig. 6 shows the section on line VI-VI in Figure 1, illustrating a cable bushing with edging,

Fig. 7 shows the section on line VII-VII in Figure 1, illustrating a moulded-in bush,

Fig. 8 shows the section on line VIII-VIII in Figure 1, illustrating a moulded-in mounting collar with a loudspeaker shown in dot-dashed lines,

Fig. 9 shows the section on line IX-IX in Figure 1, illustrating a support plate for mounting a motor,

Fig. 10 shows the section on line X-X in Figure 1, embodying a bridge zone for holding a Bowden cable, for example,

Fig. 11 shows a side view of a variant of the door internal element,

Fig. 12 shows an end view of this,

Fig. 13 shows the section on line XIII-XIII in Fig. 11, on an enlarged scale, illustrating the arrangement of the sealing body and the formation of an anchoring aperture,

Fig. 14 shows the section on line XIV-XIV in Fig. 11, once again on an enlarged scale and showing the peripheral end face, specifically as a continuation of the solid boundary layer,

Fig. 15 shows a region on the door internal element which has a thicker central layer, for example offering "meat" for screw connections,

Fig. 16 shows a cross section through the door internal element, forming an anchoring zone,

Fig. 17 shows the associated anchoring means,

Fig. 18 shows a plan view of Fig. 16, with correct orientation of the anchoring means, prior to anchoring,

Fig. 19 shows a section corresponding to Fig. 16 with the anchoring means correctly in its operating position,

Fig. 20 shows a section through the door internal element, on a further enlarged scale,

Fig. 21 shows an illustration corresponding to Fig. 16, using a material-removing operation in order to provide securing accessibility for the anchoring means,

Fig. 22 shows the same, with the anchoring means correctly in its operating position,

Fig. 23 shows a plan view of Fig. 22 with the anchoring illustrated in dot-dashed lines.

The motor vehicle door 1 which is illustrated in vertical section in Figure 2 accommodates a door internal element 3 in its cavity 2. When the door is fitted, this internal element extends substantially vertically.

The door internal element 3 is associated with the opening 4 of a frame-like door interior plate 5. It completely closes this opening 4 and, at the same time, seals it.

The door outer panel which closes off the cavity 2 on the outside is denoted by 6.

A lining 7 which closes off the cavity 2 on the passenger compartment side forms a closure on that side. This lining may cover an inlay 8 which is located on this side and is known as padding.

The edge of the opening 4 is formed as a step 9 towards the outer side of the door, forming a continuously encircling bearing shoulder 10, on which the periphery of the door internal element 3 is fully supported. This edge carries the reference numeral 11.

The support is effected with interposition of a sealing body 12. This sealing body is moulded uniformly on the edge of the door internal element 3 during production in the foam injection process. The sealing action with respect to the bearing shoulder 10 which follows the contours is increased by forming a cavity 13 in that section of the sealing body 12 which is active in terms of the sealing function. The sealing body is an elastomer seal with a continuous cavity 13. The cavity 13 is produced in the gas injection process which takes place simultaneously. The required fluid can be supplied via one or more cannulas, the puncture holes of which can close up automatically.

The securing foot 14, which faces the edge 11, of the sealing body 12 engages over the corner zone, facing the door outer side, of the edge 11. Naturally, that section of the securing foot 14, which is in this case angular, which goes beyond the end can cover the entire end face 15 of the edge 11 or be anchored. As the enlarged illustration Figure 3 shows, there is then a skin-like layer 16 which covers the entire contact zone. The elastomer material does not penetrate through this zone. The zone forms, at it were, an adhesion layer.

With regard to the door module, i.e. door internal element 3, the following materials can be used: PP, PA, ABS or PET and foaming agent (endothermic or exothermic) for foaming. The material is foamed to approx. 50% of its initial density. The door internal element 3 acquires its final form and finish in a

single foaming operation, as explained in more detail below. Suitable materials for the sealing body 12 are: TPE (TPE-V or SEBS). This material is also used for the apertures explained below.

A door internal element 3 which is produced, for example, by two-colour injection moulding is best able to utilize the advantages of a forming process. It is possible to produce complex geometries and changes in wall thickness and, at the same time, to associate further elements. The door internal element 3 is lightweight, stable and insulating or damping.

Cable holders 17 are moulded on the door internal element 3. The cable is denoted by 18 (cf. Figure 4). In specific terms, these are two freely projecting, spring-like limbs 19 which project transversely out of the general plane of the door internal element 3. The limb root widens towards the panel body. The transversely open insertion opening 20 of the cable holder 17 has a slight undercut, resulting in an excellent clip-style holder.

Figure 5 shows an arrangement in which the cable 18, rather than running supported on the element, runs through the panel body. For this purpose, a cable bushing 21 is produced, comprising a hole 22 in the panel body and a curved sealing connection piece 23 which narrows towards its free end, down to the cross-sectional dimension of the cable 18 or even less than this dimension, so that a seal is formed. The sealing connection piece 23 may consist of the same material as the sealing body 12. Moulding onto the outer side of the door internal element 3, which outer side is vitrified or has a hard skin, is optimum, in this case also with anchoring in a skin-like layer 16. Instead of adopting a curved shape there illustrated, the sealing connection piece 23 can also stand at right angles to

the general plane of the door internal element 3, and then, if appropriate, be bent into any desired direction of run of the cable 18.

The cable bushing 21 illustrated in Figure 6 dispenses with a freely projecting design in the form of a connection piece or nozzle in favour of lining the hole 22 which is present in that region over the thickness of the element 1. In this case, the cable bushing 21 is formed by an edging 24 made from soft plastics material, suitably using the material employed for the sealing body 12, specifically under identical bonding conditions to those explained in that connection. An encircling cavity 25 is also considered. In practice, there is a hole-filling annular membrane, the central opening of which, as a result of the cable 18 being inserted, engages tightly against the said cable.

From Figure 7, it can be seen how a bush 26 is fitted in terms of the moulding technology used. There is in question a bush 26 which has an internal screw thread 27 for a screw, the screw having a corresponding external screw thread, as securing element 28. The said bush 26 extends transversely with respect to the general plane of the door internal element 3, specifically lying in a trapezium-shaped geometry 29. It (26) has its roots in the narrower end face of the trapezium and projects into the channel space 30 which is produced by the wall offset and the length of which towards the outside is not exceeded by the length of the securing element 28. Rather, the free end edge of the bush 26 is flush with the left-hand outer side of the door internal element 3.

Figure 8 illustrates a holding collar 31, which is used to flange on a loudspeaker 32, illustrated in dot-dashed lines. The loudspeaker has a mounting flange 33. The dimensions of the loudspeaker 32 itself are adapted

so that its edges can be supported on the exposed holding collar 38. The holding collar 31 may be made from hard PVC.

The exposed position of the holding collar 31, which is in this case in the form of a ring, is based on a frustoconical geometry 34 of a section of the door internal element 3 in the vicinity of the edge. The holding collar 31 is rectangular or, if appropriate, even square in cross section. Its outer edge which faces towards the panel body of the door internal element 3 is embedded, specifically over the entire width of the ring cross section in the direction parallel to the panel and over half the ring thickness in the transverse direction. The same bonding effects as those described above are present here. The hole 35, which is enclosed in stable manner, in the door internal element 3 thus ends in the same plane as the inner side of the holding collar 31.

The wall offset, which is in this case of rotationally symmetrical design, for creating the frustoconical geometry 34, stabilizes the area surrounding the holding collar 31.

A further configuration is shown in Figure 9, and specifically, in that figure, a part is once again arranged in an offset-plane zone of the panel body of the door internal element 3. This part is in this case an inserted support plate 36, which forms a stable supporting base for a motor 37 which is illustrated in dot-dashed lines. The wall offset, which runs to the right in Figure 9, of the panel body of the door internal element 3 is denoted by 38. It takes into account a recess 39 which corresponds to the panel contour. This leaves an edge shoulder 40 in the exposed region. This shoulder ends in front of a window-like

aperture 41, so that the motor 37 experiences excellent edge support at 42.

The support plate 36 illustrated has male protrusions 43 which engage behind a female opening 44 by snap action. The result may be an irreversible snap connection. The male protrusions 43 are mushroom-shaped hook elements which snap behind shoulders of the female opening.

The support plate 36 may be a metal plate.

Referring now to Figure 10, there is illustrated a bridge 45 which is formed on the door internal element 3 by injection moulding. The underside 46 of the bridge is exposed. The bridge consists of cut-free loops which are pressed out of the general plane of the panel. They leave clear an eyelet 47, for a cable or, as shown in Figure 10, a Bowden cable 48, to be threaded through, for example. The corresponding structure of cuts can be seen in Figure 1, specifically in the region of the section indicator X-X from this figure.

The bridge underside 46, which is illustrated as an internal elbow with falling slopes, may also have lugs for laterally supporting the Bowden cable 48 (not shown).

If necessary, the recess portion which is not occupied by the cross section of the Bowden cable 48 can be closed off on both sides by sealing compound.

Finally, as can be gathered from Figure 2, a wall offset 49 is provided at that location in the central region. This offset is on the passenger compartment side of the vehicle door 1. In this way, a laying path 50 is formed on the door internal element 3, for example for incorporating a stabilizing element in the

form of a strip-like insert 51 made from steel. The laying path is a channel which has a trapezium-shaped cross section.

This and other highly reinforced parts, such as also the support plate 36, form a good base for the installation of window crank handle fittings and their spindles, lifters, etc.

The door internal element 3 may be screwed to the bearing shoulder 10. An adhesive bond can also be used.

The variant of the door internal element 3 which is illustrated from Fig. 11 onwards likewise consists of foam injection-formed material. Material from the large group of the thermoplastics is used. This group includes, for example, PP, PA, ABS, PET, PC+, PBT, etc. To achieve specific materials properties, two PP grades are combined with one another. The base component, up to approx. 90%, in this case comprises a copolymer. Generally, the block copolymers containing lower α-olefins, preferably ethylene, have better impact strength. To increase the melt stability of the copolymers, an HMS (High Melt Strength) polymer based on PP is admixed with the base component. By virtue of this structurally isomeric propylene polymer, the processing window is widened and stable cell growth with a uniform cell size is produced.

Furthermore, fillers and/or reinforcing substances, i.e. the polymer materials, are admixed with the foam injection-formed material. These fillers and/or reinforcing substances are up to 20% glass fibres or talc. The rigidity of the component is increased by these reinforcing substances.

The sandwich-like structure of the *spray-foamed* component which is the basis of this door internal

element 3 is based on planes of different densities, which in concrete terms means that the density of the door internal element 3 over a cross section in the immediate vicinity of an unfoamed boundary layer 52 is between 0.7 and 1.4 g/cm^3. Boundary layer 52 means the regions taken up by the wide faces of the component and not the end face, which is referred to in the text above by 15, although this itself is also closed there by an extension of the boundary layer 52. This end layer, that is to say the peripheral hinterland of the end face 15, is denoted by the reference numeral 53. The density of the core of the door internal element 3 which is enclosed by the two solid boundary layers 52 and the encircling end layer 53, which core in the present case is in the form of a foamed, porous central layer 54, by contrast is from 0.1 to 0.6 g/cm^3.

The foam structure of the thermoplastic foamed body has a surprisingly high homogeneity, which towards the solid boundary layer 52 ends virtually in the form of a boundary surface, so that the desired peripheral hard shell is in this case closed on all sides.

While the solid boundary layer 52, including the end layer 53 of course, cannot readily be penetrated, the tightly encapsulated, porous central layer 54 can be punctured or cut through, that is to say penetrated, using relatively moderate forces. The benefit to be derived from this is explained in more detail below.

The desired high modulus of elasticity of the boundary layers is achieved even if they form a relatively small proportion of the thickness. For example, even boundary layer thicknesses of 0.4 and 0.7 mm are sufficient in this regard for an overall component thickness of approx. 5 mm. The values for the strength for such boundary layers 52 are in the vicinity of 2500 N/mm^2. At

the central layer 54, on the other hand, it falls away to a value of just 600 N/mm^2.

All this constitutes the basis for problem free supporting equipping with the standard components accommodated in the vehicle door 1, such as loudspeaker, loudspeaker box, cable holder 17, cable 18, to name but a few.

With regard to the sealing body 12, the latter is now laid as a robot-controlled track on the door internal element 3. For this purpose, the sealing body 12 is formed as a closed-end bead which is applied to a wide face 55 of the door internal element 3. This bead is a foamed body with an integrally formed, highly elastic skin 56. Reference is made to Fig. 13, in which the skin 56 is illustrated as a simple boundary line. To provide good anchoring for the sealing body 12, its body, which is in this case mushroom-shaped in cross section, extends in such a way that its foot reaches into a groove 57 which starts from the wide face 55. This groove is also taken into account in the foam injection process. The groove is formed by the boundary layer 52 of the component which is located on this side, that is to say the wide face 55. The flanks and base of the groove 57 are therefore stable and remain supported by the core of the foamed body, which is itself reasonably strong, i.e. the central layer 54.

The most stable conditions are present in the region where the sealing body 12 is laid, since the groove 57 is formed by a wall offset. There is therefore no reduction in the thickness of the component. Rather, the wall offset forms a bead 58 which is located on the rear side, that is to say the other wide face 59, of the door internal element 3.

It can be seen that the bead 58 has a width which significantly exceeds the clear width of the groove 57. The ratio is approximately 1:2.

The height of the bead 58 is continuous, only leaving this plane when the corresponding stop face, formed by the bearing shoulder 10 of the step 9 of the door interior plate 5 of the motor vehicle door 1, differs in this respect. The depth of the groove 57 is precisely such that the base formed by the depressed solid boundary layer 52 lies substantially in the same plane as the boundary layer 52 which is located on the rear side.

The anchoring of the foot of the sealing body 12 is promoted by the adhesive force of the contact surfaces. There is, as it were, a thermoplastic bonding of the sealing body 12 which consists of soft foam.

Figure 13, which illustrates the arrangement of the sealing body described above, in combination with Fig. 11, shows a particular arrangement of holes for securing elements to engage through. In the region of the section indicator XIII-XIII, Fig. 11 shows how anchoring apertures 60 are formed at the end face, distributed irregularly over the periphery of the door internal element 3. Although they could be perforations or laser incisions, the apertures 60 illustrated are formed during the course of the foam injection process. The interior of the apertures 60 (cf. also Fig. 13) is therefore subjected to the same hard skin-forming conditions as those outlined in relation to the boundary layers 52 and the end layer 53, in other words: the anchoring protrusions 60 which are produced by being moulded integrally acquire a solid, stabilizing hole lining 61. This is, as it were, formed as a sleeve-like section and constitutes a fixed material bridge, in the form of a tubular rivet,

between the two boundary layers 52 which are spaced apart from one another by the central layer 54. The transition edges are rounded with a transverse convexity. In this way, the component is not squeezed together when a fastening element, such as for example a screw, is screwed in, or is not so easily squeezed together in the event of excessive force being used. Rather, a spring-loading action is formed by the restoring force. This contributes to securing the fastening. The said anchoring apertures 60 form layer-joining anchors with an extremely good stabilizing action. Due to the close proximity to the groove 57, the stabilizing action even extends to the mounting zone for the sealing body 12. There comes about also a mutual stabilizing of the entire periphery of the foam injection-formed body.

As can also be gathered from Fig. 11, an anchoring aperture 60 is surrounded by a tab section 62 which projects from an end face and is likewise foamed on integrally. Such tab sections 62 stand outwardly-directed. They may be semicircular or trapezium-shaped jutting-out flange tabs, which provide an area which is sufficiently large for the axis point of the anchoring apertures 60, which are generally round in terms of the hole contour, to be flush with the end face 15 of the door internal element 3. Such anchoring apertures 60 or even other apertures in the overall area of the door internal element 3 are, in this case also, provided with the standard bushes, threaded inserts, etc., preferably by incorporating such elements by injection moulding around them. In this respect, there are considerable variations with respect to the basic version.

Fig. 15 shows yet another detail of the door internal element 3 in that there is there a noticeable build-up of material 63 on the wide face 59, i.e. the rear side

of the door internal element 3, in order to create sufficient screw-in depth for securing elements not to project freely in the direction in which they are arranged. The boundary layer 52 circumscribes the corresponding bulge in a dome-like configuration. By contrast, the boundary layer 52 on the other side continues in plane-parallel manner. Partial build-ups of material of this type are also employed with regard to the basic version and explained therein. Reference is made to Figures 4 and 9, although these figures relate to the provision of satisfactory anchoring for the support plate 36 on an edge shoulder 40, the inner region of which has a thicker cross section towards 39 than the remaining thickness of the substantially flat door internal element 2.

While continuous anchoring apertures 60 are in principle made only outside the boundaries of the sealing body 12, anchoring apertures which are not through apertures are formed in the inner area of the door internal element 3 which is surrounded by the sealing body 12. Consequently, the partition-like sealing action of the door internal element 3 is fully retained. There is no possibility of moisture passing through.

The positioning of suitable anchoring means 64, which may be cable holders, Bowden cable guides, etc., is achieved in two different ways. One consists in removing some of the material by milling on the wide face side of the door internal element 3. This situation is illustrated in Figs 21 to 23. The reference numerals, where they have already been explained above, are adopted accordingly, in some cases without repeating the corresponding text. During the foam injection operation, a depression which reaches into the central layer 54 is generated from the desired wide face. As can be seen from Figs 21 and 23, this

depression is a slot-like trough 65 which extends as far as just in front of the solid boundary layer 52 which lies on the underside in Fig. 21, so that there is still some of the foam structure of the central section 54 in place. By introducing a milling cutter (not shown), the oval trough wall 66, which is oriented transversely with respect to the general direction of extent of the door internal element 3, is milled away. A suitable anchoring means the 64 is introduced, and the desired anchoring is present once the means 64 has been inserted and turned. The turning is effected by very moderate forces, since access to the porous central layer 54 of lower density has been provided by the milling cutter.

The anchor 67 which enters or penetrates into this structure is at the same time the blade 67' which acts plane-parallel to the direction of extent of the door internal element 3. The blade back may have a projecting barb 68 which blocks the anchor 67 from turning back.

If it is desired to provide a greater penetration depth for the anchor 67, it is possible to effect a partial thickening of the foam material, as shown in Fig. 21, by forming the build-up of material 63 discussed above, through outwardly-directed displacement of the boundary layer 52 which is remote from the installation side with respect to the trough 65.

In Figs 21 to 23, the anchoring means 64 is an item which has only one anchor.

The situation illustrated in Figs 17 to 20 is different, embodying the other form of anchoring means arrangement. In this arrangement, the trough 65 is in the form of a Maltese cross. It is, as it were, a cross-shaped trough. In this case, however, there is no

machining involved. The trough 65 remains as originally formed. Rather, the procedure in this case is that anchoring means 64 which are formed, for example, in the shape of a clip, are secured in the door internal element 3 while retaining the integral outer skin. This means that neither the access-side boundary layer 62 is abraded in the vicinity of the trough, nor is the trough wall 66 abraded. The suitably designed anchor is likewise in the form of a cross. Its four anchors 67 or blades 67', which are located distributed at regular angular intervals, engage beneath the remaining parts 69 of the foamed body which have been left in place, so that they themselves cut open the path through the trough wall 66. The restoring force of the trough wall 66 even manages to at least partially close the entrance to the cut. In this case too, the barb 68 projecting transversely from the anchor 67 is provided. The overall result is a centre-oriented system of trenches for the self-tapping entry of the side flanks of the cross-shaped rotary anchor of the anchoring means.

The pedestal 70 of the cross-shaped anchor 67, which starts from the plane of the anchor 67 and projects beyond the edge of the trough, is not round on its lateral wall side, making it easier to fit the anchoring means 64 by attaching a rotary tool. The non-round cross section may even be hexagonal, so that it is possible to use spanners.

There is no need for the pedestal 70 to be integral with a coaxially adjoining clip 71. The flattened clip 71 is therefore not used as an actuating handle. It is rotationally connected to the pedestal 70. This also has the advantage that the clip 71 is easy to align with respect to the object which is to be clamped, such as for example a Bowden cable. The position or rotary

end position of the pedestal 70 is therefore insignificant in terms of its rotational angle.

All features disclosed are pertinent to the invention. In the disclosure of the application, there is hereby incorporated the disclosure content of the associated/appended priority documents (copy of the prior application) as to its full content, also for the purpose of incorporating features of these documents in claims of the present application.

Claims

1. Door internal element (3) for motor vehicle doors (1), to be arranged between a door outer side and an inner lining (7), characterized in that, during production using the foam injection process, a sealing body (12) is disposed at the edge.

2. Door internal element according to Claim 1 or in particular according thereto, characterized in that cable holders (17) are moulded onto the door internal element (3).

3. Door internal element according to one or more of the preceding claims or in particular according thereto, characterized in that a mounting collar (31) for holding a loudspeaker (32) is moulded on.

4. Door internal element according to one or more of the preceding claims or in particular according thereto, characterized in that a cable bushing (21) is moulded out.

5. Door internal element according to one or more of the preceding claims or in particular according thereto, characterized in that the cable bushing (21) has an edging (24) made from soft plastics.

6. Door internal element according to one or more of the preceding claims or in particular according thereto, characterized in that the door internal element (3) has a moulded-in bush (26).

7. Door internal element according to one or more of the preceding claims or in particular according thereto, characterized in that the door internal

element (3) has an inserted support plate (36) for mounting a motor (37).

8. Door internal element according to one or more of the preceding claims or in particular according thereto, characterized in that the support plate (36) is a metal plate.

9. Door internal element according to one or more of the preceding claims or in particular according thereto, characterized in that the door internal element (3) has bridges (45) which are moulded out by injection-moulding techniques and the underside (46) of which is exposed.

10. Door internal element according to one or more of the preceding claims or in particular according thereto, characterized by a partial wall offset (49) in the door internal element (3) as a laying path for a strip-like insert (51).

11. Door internal element according to one or more of the preceding claims or in particular according thereto, characterized in that the sealing body (12) is formed as a bead which is applied to a wide face (55) of the door internal element (3).

12. Door internal element according to one or more of the preceding claims or in particular according thereto, characterized in that the sealing body (12) is located in an integrally formed groove (57).

13. Door internal element according to one or more of the preceding claims or in particular according thereto, characterized in that the groove (57) is formed by means of a wall offset so as to mould

out a foam injection-formed bead (58) on the rear side, that is to say the other wide face (59).

14. Door internal element according to one or more of the preceding claims or in particular according thereto, characterized in that the density of the door internal element (3) varies over a cross section, that is to say is between 0.7 and 1.4 g/cm^3 in an unfoamed boundary layer (52) and is between 0.1 and 0.6 g/cm^3 in the foamed central layer (54).

15. Door internal element according to one or more of the preceding claims or in particular according thereto, characterized in that the foam injection-formed material contains a proportion of an HMS polymer.

16. Door internal element according to one or more of the preceding claims or in particular according thereto, characterized in that the foam injection-formed material contains fillers or reinforcing substances.

17. Door internal element according to one or more of the preceding claims or in particular according thereto, characterized in that anchoring apertures (60) are provided on the end face, which anchoring apertures have a solid hole lining (61) lying in the direction of the aperture as a result of integral moulding-out.

18. Door internal element according to one or more of the preceding claims or in particular according thereto, characterized in that an anchoring aperture (60) is surrounded by an integrally foamed tab section (62) which projects on the end face.

19. Door internal element according to one or more of the preceding claims or in particular according thereto, characterized in that bushes, threaded inserts, etc. are incorporated in the door internal element (3) by injection moulding around them.

20. Door internal element according to one or more of the preceding claims or in particular according thereto, characterized in that some of the material is removed, or a cut which does not run all the way through is made, in the door internal element (3) on the wide face side, so as to provide access to the lower-density central layer (54).

21. Door internal element according to one or more of the preceding claims or in particular according thereto, characterized in that the exposed regions of the central layer (54) serve as access for anchoring means (64).

22. Door internal element according to one or more of the preceding claims or in particular according thereto, characterized in that clips (71) are secured in the door internal element (3), leaving an integral outer skin.

COMBINED DECLARATION FOR PATENT APPLICATION AND POWER OF ATTORNEY
(Includes Reference to PCT International Applications)

ATTORNEY DOCKET NUMBER
22599N1PCT/US

As a below named inventor, I hereby declare that:

My residence, post office address and citizenship are as stated below next to my name,

I believe I am the original, first and sole inventor (if only one name is listed below) or an original, first and joint inventor (if plural names are listed below) of the subject matter which is claimed and for which a patent is sought on the invention entitled:

INTERNAL ELEMENT FOR A DOOR

the specification of which (check only one item below):

☐ is attached hereto.

☐ was filed as United States application

Serial No. _____

on _____,

and was amended

on _____ (if applicable).

☒ was filed as PCT international application

Number PCT/EP99/00750

on February 5, 1999,

and was amended under PCT Article 19

on _____ (if applicable).

I hereby state that I have reviewed and understand the contents of the above-identified specification, including the claims, as amended by any amendment referred to above.

I acknowlege the duty to disclose information which is material to the examination of this application in accordance with Title 37, Code of Federal Regulations, §1.56(a).

I hereby claim foreign priority benefits under Title 35, United States Code, §119 of any foreign application(s) for patent or inventor's certificate or of any PCT international application(s) designating at least one country other than the United States of America listed below and have also identified below any foreign application(s) for patent or inventor's certificate or any PCT international application(s) designating at least one country other than the United States of America filed by me on the same subject matter having a filing date before that of the application(s) of which priority is claimed:

PRIOR FOREIGN/PCT APPLICATION(S) AND ANY PRIORITY CLAIMS UNDER 35 U.S.C. 119:

COUNTRY (if PCT indicate PCT)	APPLICATION NUMBER	DATE OF FILING (day, month, year)	PRIORITY CLAIMED UNDER 35 USC 119
Germany	198 04 781.9	06/02/1998	☒ YES ☐ NO
			☐ YES ☐ NO
			☐ YES ☐ NO
			☐ YES ☐ NO
			☐ YES ☐ NO

Combined Declaration For Patent Application and Power of Attorney (Continued)
(Includes Reference to PCT International Applications)

ATTORNEY'S DOCKET NUMBER: 22599N1PCT/US

I hereby claim the benefit under Title 35, United States Code, §120 of any United States application(s) or PCT international application(s) designating the United States of America that is/are listed below and, insofar as the subject matter of each of the claims of this application is not disclosed in that/those prior application(s) in the manner provided by the first paragraph of Title 35, United States Code, §112, I acknowlege the duty to disclose material information as defined in Title 37, Code of Federal Regulations, §1.56(a) which occurred between the filing date of the prior application(s) and the national or PCT international filing date of this application:

PRIOR U.S. APPLICATIONS OR PCT INTERNATIONAL APPLICATIONS DESIGNATING THE U.S. FOR BENEFIT UNDER 35 U.S.C. 120:

U S APPLICATIONS		STATUS (Check one)		
U S APPLICATION NUMBER	U S FILING DATE	PATENTED	PENDING	ABANDONED

PCT APPLICATIONS DESIGNATING THE U S

PCT APPLICATION NO	PCT FILING DATE	U S SERIAL NUMBERS ASSIGNED (if any)			

POWER OF ATTORNEY: As a named inventor, I hereby appoint the following attorney(s) and/or agent(s) to prosecute this application and transact all business in the Patent and Trademark Office connected therewith. *(List name and registration number)*
MARTIN A. FARBER, Esq., Reg. No. 22,345
866 United Nations Plaza, Suite 473
New York, NY 10017
U.S.A.

Send Correspondence to:
MARTIN A. FARBER
866 United Nations Plaza, Suite 473
New York, NY 10017

Direct Telephone Calls to: *(name and telephone number)*
MARTIN A. FARBER
(212) 758-2878

201 FULL NAME OF INVENTOR	FAMILY NAME: BRÜCK	FIRST GIVEN NAME: Eduard	SECOND GIVEN NAME	
RESIDENCE & CITIZENSHIP	CITY: Leverkusen DEX	STATE OR FOREIGN COUNTRY: Germany	COUNTRY OF CITIZENSHIP: Germany	
POST OFFICE ADDRESS	POST OFFICE ADDRESS: Hütte 1	CITY: Leverkusen	STATE & ZIP CODE/COUNTRY: D-51381 Leverkusen, Germany	
202 FULL NAME OF INVENTOR	FAMILY NAME	FIRST GIVEN NAME	SECOND GIVEN NAME	
RESIDENCE & CITIZENSHIP	CITY	STATE OR FOREIGN COUNTRY	COUNTRY OF CITIZENSHIP	
POST OFFICE ADDRESS	POST OFFICE ADDRESS	CITY	STATE & ZIP CODE/COUNTRY	
FULL NAME OF INVENTOR	FAMILY NAME	FIRST GIVEN NAME	SECOND GIVEN NAME	
RESIDENCE & CITIZENSHIP	CITY	STATE OR FOREIGN COUNTRY	COUNTRY OF CITIZENSHIP	
POST OFFICE ADDRESS	POST OFFICE ADDRESS	CITY	STATE & ZIP CODE/COUNTRY	

I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under section 1001 of Title 18 of the United States Code, and that such willful false statements may jeopardize the validity of the application or any patent issuing thereon.

SIGNATURE OF INVENTOR 201	SIGNATURE OF INVENTOR 202	SIGNATURE OF INVENTOR 203
E. Brück		
DATE: 18.08.00	DATE	DATE

United States Patent & Trademark Office

Office of Initial Patent Examination -- Scanning Division

Application deficiencies were found during scanning:

☐ Page(s)__________ of ______________________________ were not present for scanning. (Document title)

☐ Page(s)__________ of ______________________________ were not present for scanning. (Document title)

there is no drawings

☐ Scanned copy is best available.